receiving the input data stream; and

generating a digital form of said carrier signals carrying said subsymbols by generating and combining a time domain sequence of signals in response to said input data stream.

31.   A method as claimed in claim 30 wherein said carrier signals comprise at least a first carrier signal having a first frequency and carrying a first subsymbol and a second carrier signal having a second frequency and carrying a second subsymbol, wherein said input data stream comprises input digital first data and input digital second data, and wherein said generating comprises generating a digital form of said first carrier signal carrying said first subsymbol in response to said first data and generating a digital form of said second carrier signal carrying said second subsymbol in response to said second data.

32.   A method as claimed in claim 31 wherein said generating comprises:

storing one or more addressable tables of stored values;

addressing one or more of the tables;

reading a plurality of the stored values from the one or more tables; and

generating sets of signals to correspond to characteristics of said first and second carrier signals based at least in part on the stored values read from the one or more addressed tables.

33.   A method as claimed in claim 32 wherein the characteristics comprise frequency and phase.

34.   A method as claimed in claim 33 wherein the characteristics further comprise amplitude.

35.   A method as claimed in claim 31 wherein said receiving comprises one or more steps selected from the group consisting of:

generating the input digital first and second data from an analog input signal;

generating the input digital first and second data from a digital data input signal; and

generating the input digital first and second data from an analog input signal and a digital data input signal.

36.   A method as claimed in claim 31 wherein said generating comprises:

storing a table of values corresponding to at least a portion of a periodic wave;

addressing the table;

reading a plurality of the stored values from the table so that the read values represent the frequency and phase of said first and second carrier signals;

calculating digital values corresponding to the amplitude of the first and second carrier signals based at least in part on the stored values read from the table; and

accumulating the calculated digital values.

37.   A method as claimed in claim 36 wherein the periodic wave comprises a sine wave.

38.   A method as claimed in claim 36 wherein said system comprises a primary site including a receiver;

wherein the stored values read from the table correspond to waves having frequency and phase characteristics corresponding to the frequency and phase characteristics of the first and second carrier signals to be transmitted to the receiver of the primary site;

wherein said calculating comprises multiplying stored values read from the table by an amplitude factor to generate said calculated digital values, the amplitude factor being dependent on the input digital first and second data; and

wherein said accumulating comprises summing said calculated digital values.

39. A method as claimed in claim 38 wherein said addressing the table comprises:

controlling the step sizes of the sequence of addresses that are to be used to address the table, including a first step size corresponding to the first carrier signal and a second step size corresponding to the second carrier signal; and

setting the start location at which the table is first addressed for each of the first and second step sizes in response to the input digital data.

40. A method as claimed in claim 39 wherein said controlling comprises generating a plurality of step sizes which correspond to a number of carrier signals less than the number of carrier signals received by the receiver of the primary site.

41. A method as claimed in claim 37 wherein the table comprises digital data corresponding to a complete sine wave.

42. A method as claimed in claim 40 wherein the table comprises digital data corresponding to a complete sine wave.

4

43. A method as claimed in claim 40 wherein the table comprises digital data corresponding to a quarter sine wave.

44. A method as claimed in claim 43 and further comprising the step of generating data representing a complete sine wave from the digital data in the table.

45. A method as claimed in claim 30, wherein the carrier signals carry at least some subsymbols aligned in time.

46. A method as claimed in claim 31, wherein said generating comprises:

generating samples of said first carrier signal;

generating samples of said second carrier signal; and

combining said samples of said first carrier signal with said samples of said second carrier signal.

47. A method as claimed in claim 31 wherein said generating comprises:

generating at a first point in time a digital first signal representing at least a first sample of said first carrier for a predetermined sample time period;

generating at a second point in time a digital second signal representing at least a second sample of said second carrier for said predetermined sample time period;

storing at least said first signal; and

combining at a third point in time the first and second signals to generate at least a third signal representing the combined first and second samples for said predetermined sample time period.

48. A method as claimed in claim 31 wherein said receiving comprises dividing received data into said first data and said second data, wherein said first data

comprises a first data group and wherein said second data comprises a second data group, and wherein said generating comprises generating said first carrier signal carrying said first subsymbol in response to said first data group and generating said second carrier signal carrying said second subsymbol in response to said second data group.

49.   In a communication system, apparatus for generating an output data stream for subsequent digital-to-analog conversion to carrier signals having different frequencies and carrying subsymbols from an input data stream, said apparatus comprising:

means for receiving the input data stream; and

means for generating a digital form of said carrier signals carrying said subsymbols by generating and combining a time domain sequence of signals in response to said input data stream.

50.   Apparatus as claimed in claim 49 wherein said carrier signals comprise at least a first carrier signal having a first frequency and carrying a first subsymbol and a second carrier signal having a second frequency and carrying a second subsymbol, wherein said input data stream comprises input digital first data and input digital second data, and wherein said means for generating comprises means for generating a digital form of said first carrier signal carrying said first subsymbol in response to said first data and for generating a digital form of said second carrier signal carrying said second subsymbol in response to said second data.

51.   Apparatus, as claimed in claim 50, wherein said means for generating comprises:

means storing one or more addressable tables of stored values;

means for addressing one or more of the tables;

means for reading a plurality of the stored values from the one or more tables; and

means for generating sets of signals to correspond to characteristics of said first and second carrier signals based at least in part on the stored values read from the one or more addressed tables.

52.   Apparatus as claimed in claim 51 wherein the characteristics comprise frequency and phase.

53.   Apparatus as claimed in claim 52 wherein the characteristics further comprise amplitude.

54.   Apparatus as claimed in claim 50 wherein said means for receiving comprises one or more means selected from the group consisting of:

means generating the input digital first and second data from an analog input signal;

means for generating the input digital first and second data from a digital data input signal; and

means generating the input digital first and second data from an analog input signal and a digital data input signal.

55.   Apparatus as claimed in claim 50 wherein said means for generating comprises:

means for storing a table of values corresponding to at least a portion of a periodic wave;

means for addressing the table;

means for reading a plurality of the stored values from the table so that the read values represent the frequency and phase of said first and second carrier signals;

means for calculating digital values corresponding to the amplitude of the first and second carrier signals based at least in part on the stored values read from the table; and

means accumulating the calculated digital values.

56.   Apparatus as claimed in claim 55 wherein the periodic wave comprises a sine wave.

57.   Apparatus as claimed in claim 55 wherein the system comprises a primary site including a receiver;

wherein the stored values read from the table correspond to waves having frequency and phase characteristics corresponding to the frequency and phase characteristics of the first and second carrier signals to be transmitted to the receiver of the primary site;

wherein said means for calculating comprises means for multiplying stored values read from the table by an amplitude factor to generate said calculated digital values, the amplitude factor being dependent on the input digital first and second data; and

wherein said means for accumulating comprises means for summing said calculated digital values.

8

58. Apparatus as claimed in claim 57 wherein said means for addressing the table comprises:

means for controlling the step sizes of the sequence of addresses that are to be used to address the table, including a first step size corresponding to the first carrier signal and a second step size corresponding to the second carrier signal; and

means for setting the start location at which the table is first addressed for each of the first and second step sizes in response to the input digital data.

59. Apparatus as claimed in claim 58 wherein said means for controlling comprises means for generating a plurality of step sizes which correspond to a number of carrier signals less than the number of carrier signals received by the receiver of the primary site.

60. Apparatus as claimed in claim 56 wherein the table comprises digital data corresponding to a complete sine wave.

61. Apparatus as claimed in claim 59 wherein the table comprises digital data corresponding to a complete sine wave.

62. Apparatus as claimed in claim 59 wherein the table comprises digital data corresponding to a quarter sine wave.

63. Apparatus as claimed in claim 62 and further comprising means for generating data representing a complete sine wave from the digital data in the table.

64. Apparatus as claimed in claim 49, wherein the carrier signals carry at least some subsymbols aligned in time.

65.   Apparatus, as claimed in claim 50, wherein said means for generating comprises:

means for generating samples of said first carrier signal;

means for generating samples of said second carrier signal; and

means for combining said samples of said first carrier signal with said samples of said second carrier signal.

66.   Apparatus as claimed in claim 50 wherein said means for generating comprises:

means for generating at a first point in time a digital first signal representing at least a first sample of said first carrier for a predetermined sample time period;

means for generating at a second point in time a digital second signal representing at least a second sample of said second carrier for said predetermined sample time period;

means for storing at least said first signal; and

means for combining at a third point in time the first and second signals to generate at least a third signal representing the combined first and second samples for said predetermined sample time period.

67.   Apparatus as claimed in claim 50 wherein said means for receiving comprises means for dividing received data into said first data and said second data, wherein said first data comprises a first data group and wherein said second data comprises a second data group, and wherein said means for generating comprises means for generating said first carrier signal carrying said first subsymbol in response to

10

said first data group and for generating said second carrier signal carrying said second

subsymbol in response to said second data group.

A fee for the additional claims is enclosed.

Date: <u>March 28, 2001</u>   Respectfully submitted,

Ronald E. Larson
Reg. No. 24,478
Attorney for Applicant

McAndrews, Held & Malloy, Ltd.
500 W. Madison, 34th Floor
Chicago, IL 60661
312.775.8000